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PUBLISHER'S AND EDITOR'S CORNER

We apologize for there being only three issues this year, and thank you for your patience. This time the delay (in issue 22) was caused by Chris. So we each have one delay. Again, let me ask you all to remember that we receive no pay and make no profit on the newsletter, and that our normal jobs and activities sometimes take precedence.

SHORT CONTRIBUTIONS

$30 RADIO SHACK PORTABLE OUTPERFORMS R–390: In the Frequency Deviations column, "Ray Cole's earthquake research progress report," *DX News* 56, 25 (Apr. 24, 1989), page 35, Ray said, "I have four antennas to try, and on the BCB band the TRF beats my National NC–173 by a lot, and the R–390 lags a very sad third." (Anonymous) [Maybe he didn't have the R–390 turned on. If anyone wants to trade an R–390 for an NC–173, let me know. Ed.]

WANTED: Power supply PP-629/URR and special purpose electrical cable assembly CX-2083/U for my R-391. (Richard Parker, KB2OMD, 21 Blue Grass Dr., Trenton, NJ 08638)

WANTED: CV-591, CV-1758, or CV-157 by TMC. Hammarlund HC-10 also considered. (George Ross, 127 Cebtre St. West, Richmond Hill, Ontario L4C 3P6, Canada, (416) 884-4116) [Fair Radio usually has some of the CV series sideband converters. Ed.]

3TF7 MOD: After consulting with Dallas about the various ways of eliminating the 3TF7, I settled on Irving Megeff's mod in *HSN* **17**, Fall 1987, pp 5-6. I farmed the job out to a chap up here who specializes in amateur radio repair. While testing the mod, he noticed that the resistor ran hot (it is underneath the chassis). So he used three 15 ohm 10 watt resistors in series instead of a single 40 ohm 5 watt resistor. This runs quite cool. The mod works like a charm. (George Ross) [Thanks for the feedback. This kind of information helps us all. Ed.]

26Z5W TUBES FOR SALE: Up to 20 new 26Z5W's for $3.60 each plus shipping. Darcell Electronics, 4910 Santa Anita Ave., El Monte, CA 91732, (818) 443-5801. They also have 73 used, checked 26Z5W's at the same price. (Joe Bunyard)

R-388 AND 51J RF AMP TUBE SUB: The RF amplifier, a 6AK5, can be replaced by a 6BZ6 for approximately 10 dB increase in gain as seen on the S-meter by disconnecting the antenna and switching on the 100 KHz calibrator. (Walter Hann) [I checked the mod using a URM-25D signal generator and a 51J-4. The URM-25D was set to 2.5, 25, 250, and 2500 microvolts. Corresponding S-meter readings with a 6AK5 were 10, 40, 65, and 85 dB. Corresponding readings with a 6BZ6 were 8, 32, 56, and 90 dB. You can see that on the very strongest signals the 6BZ6 gives higher readings, on mid range signals the 6BZ6 gives lower readings, and on weak signals the 6BZ6 gives about the same readings as a 6AK5. I did not measure the dynamic ranges, but the higher 6BZ6 S-meter readings on strong signals suggests that the 6BZ6 would degrade the strong signal handling performance of an R-388 or 51J series receiver. Also, the 6BZ6 pins the S-meter on some strong signals. I would recommend against this sub unless your 6AK5 dies and a 6BZ6 is all you have. Ed.]

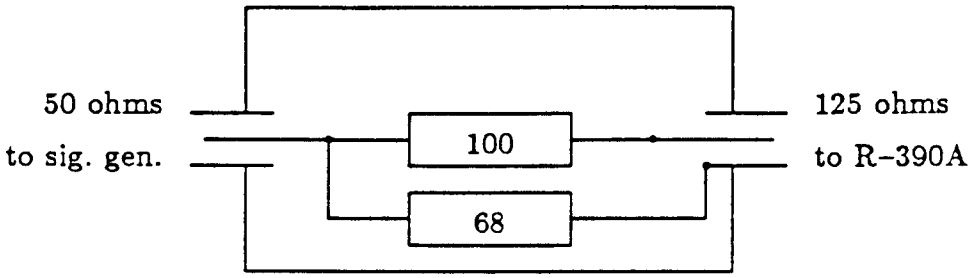
TUBE SHIELDS MOD: For better heat removal, I have all of my tube shields painted black, inside and outside. This is easy to do with black spray paint. (Walter Hann) [Some tube shields in Collins equipment were originally painted black, and some were anodized a dark blue. Ed.]

RF PROBE: A good RF probe (e.g., for making measurements on the RF subchassis of an R-390A) is the PK-3A, available form Heathkit, Benton Harbor, MI 49022. It can be used with any DC voltmeter with an input impedance of 10 megohms. RF measurements from 1 KHz up to 100 MHz, up to 90 volts, with an accuracy of 10% can be made with the probe. (Walter Hann)

R-388A: Did you know that there was an R-388A, a military version of the 51J-4 (with mechanical filters)? I didn't until Wally Chambers and Walter Hann told me. Wally sent a page from MIL-HDBK-161 which said, "Radio Receiver R-388A/URR, procured by the USN, is identical to the R-388/URR, except that it uses mechanical filters and nonmagnetic side panels." Has anyone ever seen one of these? (Ed.)

DA-121/U DUMMY LOAD: The DA-121/U dummy load was used by the military to measure the sensitivity of an R-390A. It consists of a small RF tight metal enclosure with one BNC female connector at each end. A 100 ohm half watt resistor is connected in series with the center conductors of the BNC connectors. A 68 ohm half watt resistor is connected from one of the BNC center conductors to ground. The BNC connector with the 68 ohm resistor to ground is the signal input port (which is connected to a signal generator). The other BNC connector is the signal output port (which is connected to

the R-390A). (Walter Hann) [Thanks for the information. The DA-121/U dummy load appears to be an impedance matching device which matches 50 ohms to 125 ohms. I fabricated one and have used it to make precise sensitivity measurements on R-390A's. It works great. Below is a cut-away line drawing. Ed.]



$1700 R-390A: An advertisement by EAC Industries, Inc. in the Oct. 1968 issue of *73 Magazine* listed brand new, 1968 production R-390A's for $1700, with a few new, but shelf-worn, units available at lower prices. Each included original packing, two instruction books, and a complete set of running spares. These probably were the end of a military contract, and may not have met mil specs. (Wally Chambers)

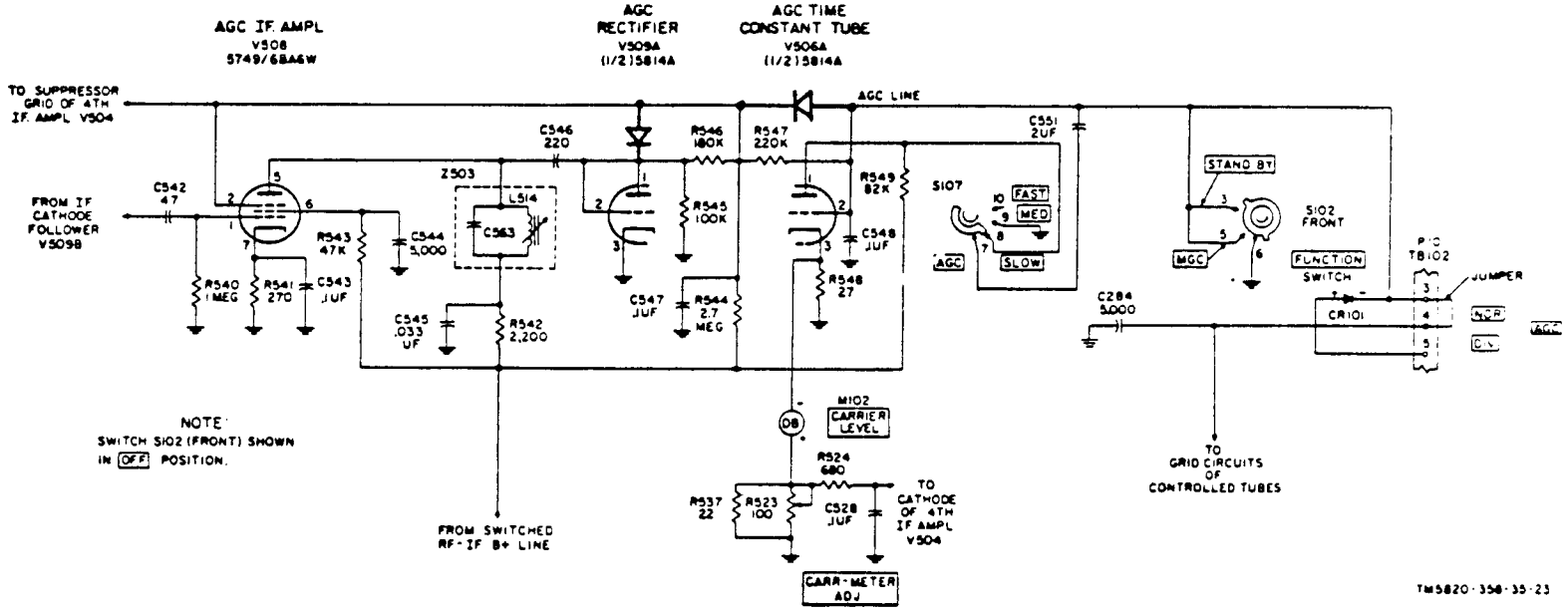
R-390A PTO ADVENTURES: One thing I noticed about my R-390A some months after its acquisition was that the PTO end points were so far out of alignment that I could not calibrate the KCS dial throughout the tuning range. I decided to take what I thought was the easy way out and order another PTO from Fair Radio. A few days after the arrival of the new PTO, I finally had an evening to spend on the replacement. But when I tried to loosen the spline set screw on the Oldham coupler, I found that someone had been there before me and stripped the splines. I tried everything – a larger spline wrench, hex wrenches, even super gluing a hex wrench to the screw. Nothing worked. Finally, a friend suggested I get a needle file, file a notch in the socket head, and remove it with a blade screwdriver. If you've never seen a needle file, they are similar to an aluminum nail file, but smaller and thicker. They are miniature files, and usually come in a set with various shapes and sizes. Once you see a set, you will recognize them as tools you needed, but didn't know you needed. Anyway, I filed and filed, and at last made enough of a notch that I could turn the screw with a blade screwdriver. When I got it out, I found that the threads were stripped at one point, which had caused the problem. I replaced it with a normal slot head screw, not having any spare spline screws. Removal of the old PTO and installation of the new PTO were routine with the help of Dallas' instruction on PTO alignment in *HSN* **6**. Thanks Dallas. If anyone has similar problems, I'd be happy to go into more details any time. (Joe Reda, 4237 Hamilton Ave. #B. San Jose, CA 95130) [More good feedback. And I want a set of needle files. Ed.]

MANUALS: In a previous issue of *HSN* I mentioned Mil-Com Exchange Electronics, P.O. Box 982, Orange Park, FL 32067-0982, as a potential source of manuals. I bought the R-390A operating manual, TM 11-5820-358-10 ($9.00) and the SP-600 manual, actually three manuals in one ($12.75). Both have excellent print and picture quality. They were punched for a standard three ring binder, and had heavy (cord) stock for the front and back covers. The SP-600 had folded 11 by 17 inch sheets for the oversized pages, not the patchwork pages you often get. I plan to order the R-389 maintenance manual from them. (Shaun Merrigan) [Thanks for the follow up. I wonder if they reproduce the two huge schematic pages of the R-390A depot maintenance manual TM 11-5820- 358-35 without cutting and pasting. Also, I noticed they sell the NAVSHIPS 93053 series of R-390A manuals. After writing this, I ordered their SP-600 and R-388 manuals. They are excellent reproductions.

However, I was somewhat disappointed with their SP–600 manual. It contains only one schematic. But there are several production runs of SP–600's (military R–274), and all are wired differently. I have been told that he best manual for SP–600's is the Army manual TM 11-851. It contains all the different schematics, by serial number. Ed.]

MORE MANUALS: The National Archives, Washington, D.C. 20408 is a source for some manuals and technical bulletins which cannot be found elsewhere. I have obtained copies of TB 11-6625-697-35 (for calibrating the URM-25 series signal generators) and TM 11-854 (the R–388 maintenance manual) from them. (Walter Hann) I purchased a reprint of the R–389 manual from The National Archives. Their prices are, however, rather steep, generally 35 cents per page, with postage extra. The reprint I received did *not* contain a complete circuit diagram. (Terry Robinson)

R–390A AGC MODS: The R–390A maintenance manual TM 11-5820-358-35 goes into considerable detail about the AGC circuit (pages 32 – 34), and includes the following simplified schematic.



The AGC's of many R–390A's, including mine, have been modified using the so-called Cornelius AGC mod which was described in *HSN* **1** and **10**. The mod consists of removing R545, replacing R546 by a 1N34A, 1N60, 1N270, 1N914, or 1N4158 diode with cathode connected to pin 1 of V509A, and replacing of R547 by a 10K ohm half watt resistor. The mod increases the AGC line voltage, which reduces the signal level at the diode detector V506B and, consequently, improves SSB reception quality.

Recently I discovered a modification which is easier to do and increases the AGC release times for FAST and MED. My mod does not require removing any components. You merely add two diodes as shown on the schematic above. I used 1N270 (actually ECG 109) diodes, but any of the diodes mentioned above could be used. Measured attack times for my mod are 0.001, 0.01, and 0.2 seconds, and release times are 0.01, 0.12, and 2.5 seconds for FAST, MED, and SLOW respectively. The times vary somewhat from one IF subchassis to another. The attack times are virtually the same as for the Cornelius mod. The FAST and MED release times are about twice as long as for the Cornelius mod, which is a modest improvement for SSB using the MED AGC position.

The attack and release times are not optimal for SSB; 0.002 seconds attack and 1 second release are often recommended. However, the MED position does provide acceptable SSB reception, and is a big improvement over an unmodified IF subchassis. (Dallas Lankford)

R-388 NOTES: Recently I obtained a very nice R-388 theough the Yellow Sheets. It seemed fairly well aligned, all controls worked fine, and there were no surprises. Dallas' review of the 51J series receivers from *HSN* **20** was a big help in evaluating my "new" R-388. Regarding stability, I would certainly agree that the R-388 compared favorably with my R-390A. There is some backlash in the KCS tuning dial of my R-388, like Dallas observed in the 51J series receivers. I have eliminated the backlash by inserting two small pieces of rubber, one between each end piece and center piece of the Oldham coupler. The rubber pieces are small enough to permit the center piece to mate with the end pieces, but large enough to take up the slack. And they produce very little pressure, so the PTO bearings will not be damaged. [Nice idea. Ed.] I was lucky in that the MCS dial drum decal in my R-388 had only two small spots flaked off. To prevent further flaking, I gently cleaned the entire drum with a dilute (0.1%) sodium ~~hydrochloride~~ * solution, and gave it three coats of Flecto Varathane liquid plastic, clear gloss #90. No deterioriation of the numbering was observed. In fact the numbers are easier to read because of the glossy drum surface. In my experience, the sodium ~~hydrochloride~~ * solution does not hurt old plastics, and removes the yellow tinge so often found on older dial indicators and plastic parts. To give the knobs a like new appearance after cleaning, I used Armor All protectant. For smooth nonporus surfaces, Armor All Ultra Plate works very well. Finally, with regard to SSB, I attached a Central Electronics Sideband Slicer, Model B to my R-388 and got excellent results. (Shaun Merrigan)

* HYDROXIDE

AN/FRR-59A: I have been going through the NAVSHIPS 94715 manual for the AN/FRR-59A, which I obtained from Mil-Com in FL, and I have never seen tube circuits like these before. It is apparent that the 59A was a tube precursor of current solid state digital receivers as it contained frequency synthesis, drift cancelling loops, balanced ring modulators, 100 Hz mechanical digital readout, 64 (!!) tubes, and so on. I would be interested to know if any of our members use or have used the 59A. (Shaun Merrigan)

MORE COLLINS 51J TECHNICAL NOTES: The following is taken from my 6 page article article, "More Collins 51J Technical Notes," which is available for a $1 bill and a SASE with 65 cents in stamps.

Apparently I lead a charmed life because both of my J4's have nearly perfect PTO's with end points off by no more than 1/2 kHz, linearity within 1/2 kHz at each 100 kHz point from end to end, and little warm up drift. In addition, the end point adjustment shaft in both PTO's, though stiff, can be turned with the home made alignment tools I described in my first technical notes article.

The PTO in a virtually unrepairable J4 which was recently brought to me for repair showed me how lucky I had been. The end points were about 15 kHz off, and when I tried to do an end point adjustment I discovered that the end point adjustment shaft slot had been broken by a previous owner. Since I had a bad PTO with a good end point adjustment coil from a junker R-388 I decided to try to repair the otherwise good PTO. However, in the process of switching end point adjustment coils I noticed that the good coil would not screw in. Something appeared to be stopping it. I backed the shaft out all the way and saw the problem. There was a shaft lock "nut," a small threaded circular piece of metal with two minute slots in it. Then I remembered the Collins PTO end point adjustment tool which is pictured in the J4 manual, and suddenly the peculiarity of that tool (actually two tools) made sense. One tool is like a small screw driver, but with a knurled end rather than a handle. The other tool is hollow, with two thin "blades" on the rim of the hollow tube. The screw driver tool is inserted into the hollow tool and the two are used together to unlock and lock the end point adjustment shaft lock nut, and the hollow tool is used to prevent the lock nut from locking while the shaft is screwed in. Apparently some end point adjustment shafts can be screwed in with the lock nut "locked" (like those in my two J4's) and some cannot (like the one in the J4 with the broken slot). A J4 with an end point adjustment shaft which cannot be screwed in with the shaft locked can still be adjusted by backing the shaft out all the way to access the lock nut, backing

the lock nut out all the way, adjusting the end point, backing the shaft out all the way while counting turns, and then by trial and error setting the lock nut at just the right position so that the shaft can be screwed back in the correct number of turns. Good luck! After replacing the broken end point adjustment coil, the end points were still about 10 kHz too wide with the end point adjustment shaft screwed all the way in. Oh well, I still had a brand new (er, unused) J4 PTO which I had been saving in reserve. But to make a long story short it was bad too, with end points 4 kHz too wide after the end point adjustment shaft was screwed in all the way.

Are there two kinds of 51J series PTO's, those with end point spread rates about 1.5 kHz per year, and those with very slow spread rates? If I knew the answer, I would tell you. My best guess is that there are, but I have not had my two J4's long enough to know. If there are, then there are two inherent categories of 51J series and R–388 receivers, those with "good" PTO's and those with "bad" PTO's. In my opinion a substantial amount of the value of a 51J series receiver is directly proportional to the quality of the PTO. For example, end point spreading of a bad PTO will eventually desensitize the low bands, especially band 1, and in any case accurate frequency determination is one of the primary desirable features of 51J series receivers. Is there any way to tell such 51J series receivers apart without checking the end point adjustment range? I can't think of any. You are probably in the hands of fate when you buy a 51J series receiver. (Dallas Lankford)

SP–600 REPAIRS: My SP–600 is back on line after losing reception on the three high bands (above 7.4 MHz). The problem was in the 2nd (3.5 MHz) conversion oscillator and mixer, but it was not easy to pinpoint. I tried the usual fix of new (unused) tubes with negative results. Using the SP–600 manual, I then spent several frustrating hours tracing an *apparent* low screen voltage mixer tube problem all the way back to the mains transformer secondary. Then I remembered Dallas' remark about the HQ–180A manual tube socket voltage chart being incorrect in places. Assuming the same for the SP–600 manual, I proceeded to trace the problem to the 3.5 MHz crystal. This is where things got interesting. Upon application of heat (a soldering iron tip, for example, which is how I discovered it), the oscillator would work fine until it cooled down. I decided to try to remove and clean the crystal unit, as I knew I could not get a new one easily. To my surprise, I found that the pressure spring and holder assembly were covered with a film of light oil, rather like the kind left behind by the Chemtronics cleaner and lubricant I had used on the selectivity switch. The seal on the crystal assembly, such as it might have been, had gone years ago. I completely disassembled the crystal unit right down to the piece of quartz and cleaned everything with isopropyl alcohol. After reassemble and installation, the oscillator and receiver worked fine. Apparently the oil film had formed an electrical or mechanical barrier which prevented the crystal from oscillating. The moral of this story is: Watch where you spray the cleaner and lubricant! (Shaun Merrigan) [Great story, Shaun. Ed.]

FOR SALE: Signal generators, checked: URM-25F $50, H. P. 606A $85, H. P. 608D $100; distortion analyzers, as is: H. P. 330D $50; oscillloscopes, checked: USM–281A $300, USM–281C $400. No manuals are included. Photocopies of manuals probably can be obtained from Fair Radio. Lid accessories are not included with the URM–25Fs, but are available; include SASE for a price quote. (Joe Bunyard, 1601 Lexington St., Waco, TX 76711)

51J AND R–388 FLAKING MCS DIAL DECAL: I have been working on another solution for the flaking MCS dial decal, namely making new decals. I have the camera ready masters (for a two color copy) which I produced with my typesetting software. What I don't have is the name and address of a company which makes the old fashioned, water transfer decals. Can anyone help? If I had a dial drum to work from, I could also make camera ready masters for the 75A series ham band only receivers. (Dallas Lankford)